



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

Tel (613) 632-5200

D407-667-205
Job Sheet 168984



Part No: D407-667-205

Job Qty: 1 ea

Part Name: Aft Crosstube - High 407



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 11/28/17

Job Tracking No:

Due Date: 12/15/17

Created By: Linda Lacelle

Type: SOLD

Description:

Customer: Helex LLC (CHELE01)

7016 Challenger Avenue Titusville, FL, 32780 USA ph:(321) 268-4969

Note: DWG REV G IPP Rev:C 05.09.02 Add holes for comp. w/ Bell Skids KJ/JLM IPP Rev:D Add Magnobond,Rubber Cushion,Clamps 07-02-19 JLM IPP Rev:E 08-05-22 add comment seq. 6 & QC15 & QC5 DD verf:EC IPP Rev:F 08-06-12 add comment seq. 24 DD verf:EC IPP Rev:G 08-08-19 revE per dwg DD verf:EC IPP Rev H 09.01.06 ECN 08-562 EC verf:DD IPP Rev:I 10.04.07 revise route seq. in bom DD verf:JLM IPP Rev J 11.04.26 removed abrasion strip ecn 11-551 EC verf:DD IPP REV:K 11.10.03 DEOD407-667-245-F-2 DD verf:EC

Ship Via:

Bill of Materials

DART
AEROSPACE
S016092



Aft Crosstube - High 407

Dart Aerospace Ltd.
1270 Aberdeen Street
Hawkesbury, ON K6A 1K7
CANADA
TEL.: 1 613 632-5200
Email: sales@dartaero.com
www.dartaerospace.com

PART NO: D407-667-205
Revision:
Operation: Outsource
Change No:

Mfg Date: 11/30/17
Job No: 168984

D407-667-205/168984/S016092

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Aft Crosstube - High 407

PART NO:
Revision:
Operation:
Change No:

D407-667-205

Start up Operation

Mfg Date: 11/30/17
Job No: 168984

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Sign-off
					Setup hrs	Run Hrs	Workcenter / Supplier	Lead Time	
90	Start up Operation	1 Ea		12/14/17	0.00	0.00	Start Up Stores/Pkg-1		
110	Packaging	1 pcs		12/14/17	0.00	0.00	Packaging1		
120	CNC Bend Skid tubes	1 pcs		12/14/17	1.99	3.33	CNC Bend Skid tube		
130	QC	1 pcs		12/14/17	0.00	0.00	QC15		
140	Crosstubes	1 pcs		12/14/17	0.00	3.47	Crosstube		
150	HandFXtube	1 pcs		12/14/17	0.00	0.91	HandFinish5		
160	QC	1 pcs		12/14/17	0.00	0.00	QC7		
170	QC	1 pcs		12/14/17	0.00	0.00	QC5		
180	Outsource	1 pcs		12/14/17	0.00	0.00	Outsource2		
190	Packaging	1 pcs		12/14/17	0.00	0.00	Packaging2		
200	QC	1 pcs		12/14/17	0.00	0.00	QC5		
210	SprayPaint	1 pcs		12/14/17	0.00	1.39	Spray Paint		
220	QC	1 pcs		12/14/17	0.00	0.00	QC14		
230	Crosstubes	1 pcs		12/15/17	0.00	3.47	Crosstube		
240	QC	1 pcs		12/15/17	0.00	0.00	QC5		
250	Packaging	1 pcs		12/15/17	0.00	0.00	Packaging1		
260	QC	1 pcs		12/15/17	0.00	0.00	QC4		
265	DC	1 pcs		12/15/17	0.00	0.00	DC		
270	Packaging	1 pcs		12/15/17	0.00	0.00	Packaging3		
280	QC21-FG	1 Ea		12/15/17	0.00	0.00	QC21		

Part Op 120 - 1-Bend tube as per Dwg D407-667-245 using CNC bender program 407 Aft and Folio 21

Descriptions: 140 - ***** ENSURE PROPER JIG POSITIONING BEFORE DRILLING***** , VERIFIED BY: ***** 1-Drill pilot holes in tube using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill all (3) top holes. Holes facing inboard. Drill and Ream all holes in tube to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245 2- Drill fwd rivet holes using drill Jig DT8787 fwd as per Dwg D407-667-245. Note: FWD side has 3X top holes facing inboard. 3- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint. 4- Flip tube and switch drilling Jigs from right to left, left to right. Locate Jigs off existing holes using "T" pins. Drill ONLY 2 top holes ONLY plug most bottom hole to prevent accidental drilling. Drill holes and ream using drill Jig DT8583 & DT8584 as per Dwg D407-667-245. Drill only the top (2) holes. Drill & ream the top (2) holes to finish size using drill Jig DT8583 & DT8584 as per Dwg D407-667-245 5-Drill aft rivet holes using drill Jig DT8787 aft as per Dwg D407-667-245. Drill only the top (2) holes. 6- C'sink holes as per dwg D407-667-245. Allow rivet to sit below surface to compensate for paint. 8-*** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***Debur & Inspect for surface damage. Repair damage within limits as per Dwg D407-667-245

150 - ***IMMEDIATELY AFTER GRINDING***

180 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 0380

190 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

200 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE***

210 - *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** 1-Prime inside and outside crosstube as per DEO D407-667-245 and QSI 005 4.2 ***Mask underside of crosstube as shown*** 3- Apply clear coat as per dwg Clear Coat Batch: 137170 Primer 138646 white 138637

220 - Then, Wrap in plastic bag to protect from scratches

230 - 1- Install chafing shield as per D407-667-245 using DT10096 to establish 8.90 dimension. Top holes should be facing up. ****Ensure chaffing is to be position "overlap" AFT**** A/R Proseal 890 Batch: 138708 EXP: 5/12 2- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe 3-Install support with Scotch-Weld DP460 and install clamps as per Dwg D407-667-245 using installation jig DT9025. Torque clamps as per dwg A/R Scotch-Weld DP460 Batch: 137679 EXP: 6/18 ***LET CURE FOR 24 HOURS*** CURE TIME: 17-12-24 FINISH: 17-12-26 4-Install nut plates as per Dwg D407-667-245. Touch-up rivet heads with Imron paint.

240 - ***RE-CHECK TORQUE ON CLAMPS AFTER ADHESIVE HAS CURE FOR 24HOURS AS PER DWG DEO***

265 - Photocopy bluefile and create labels as per PPP D407-667-205 CHG009

270 - Identify and in kanban rack

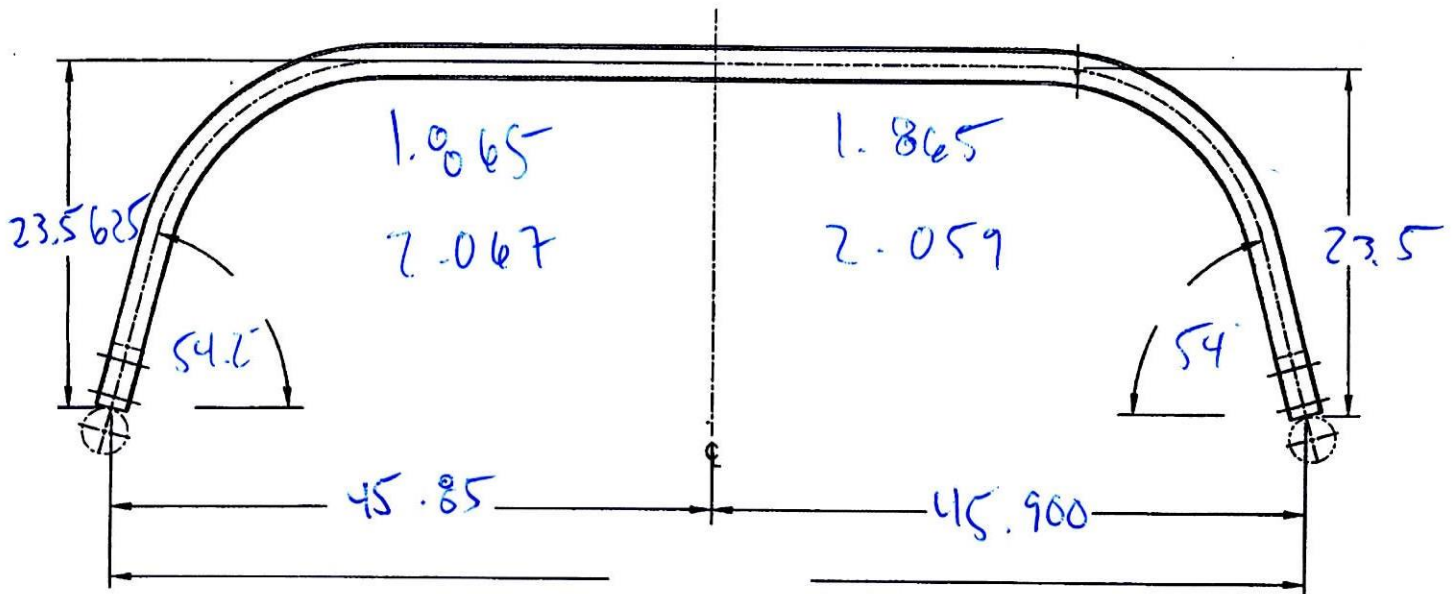
Job Allocations						
Operation	Component Part	Required	Inventory	Allocated	Std Qty	
90-Start up Operation 230-Crosstubes	D407-667-205TRN	1	4	0	0	
	D2873-043	2	81	0	0	
	D2873-045	2	21	0	0	
	D2894-1	1	9	0	0	
	D3190-1	2	59	0	0	
	D3595-075-430	5	8	0	0	
	MS20601-AD4W8	18	323	0	0	
	MS21920-22	4	123	0	0	
	MS21920-25	2	179	0	0	
	NAS1149D0563J	18	1,090	0	0	
250-Packaging	AN5-10A	10	289	0	0	
	AN5-32A	4	117	0	0	
	AN5-34A	4	57	0	0	
	MS21042L5	4	240	0	0	

Part Specifications	
Specifications could not be found.	

Plex 11/28/17 1:06 PM dart.lacelle.linda

DART AEROSPACE LTD		Work Order: 168984
Description: Crosstube High Aft (407)		Part Number: D407-667-205
Inspection Dwg: D407-667-245 Rev: G		Page 1 of 1

Required Dimension	Min	Max
Height	23.39	23.65
1/2 Span	45.79	46.05
Angle	54	56
Total Span	91.58	92.100
Bending Passes	6	--
Crushing	--	6%



	Side A	Side B
Bending Passes	28	28
Crushing	5-17	4-9.1
Comments		

QC15 Inspection	
Date	

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	09.06.22	Dwg Rev updated	KJ	
C	11.08.22	Dimensions updated	KJ	
D	11.09.30	Dimensions updated	KJ	
E	12.04.16	Added bending, crushing dimensions	KJ	
F	15.05.14	Dwg Rev updated	KJ	

Item	QTY -245	PART NUMBER	DESCRIPTION
	X	D407-667-245	CROSSTUBE ASSEMBLY (407 HIGH AFT)
1	1	D6011-115	CROSSTUBE
2	2	D2873-043	NUT PLATE
3	2	D2873-045	NUT PLATE
4	1	D2894-1	SUPPORT
5	2	D3190-1	CHAFING SHIELD
6	2	D3595-063-430	RUBBER CUSHION
7	14	MS20601AD4W8	RIVET (OR NAS9302B-4-8)
8	4	MS21920-22	CLAMP
9	2	MS21920-25	CLAMP (OR MS21920-24)
10	AR	SCOTCH-WELD DP460	EPOXY ADHESIVE, 3M SCOTCH-WELD
11	AR	PROSEAL 890	SEALANT

GENERAL NOTES:

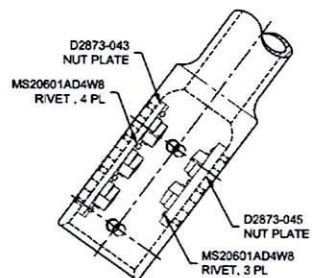
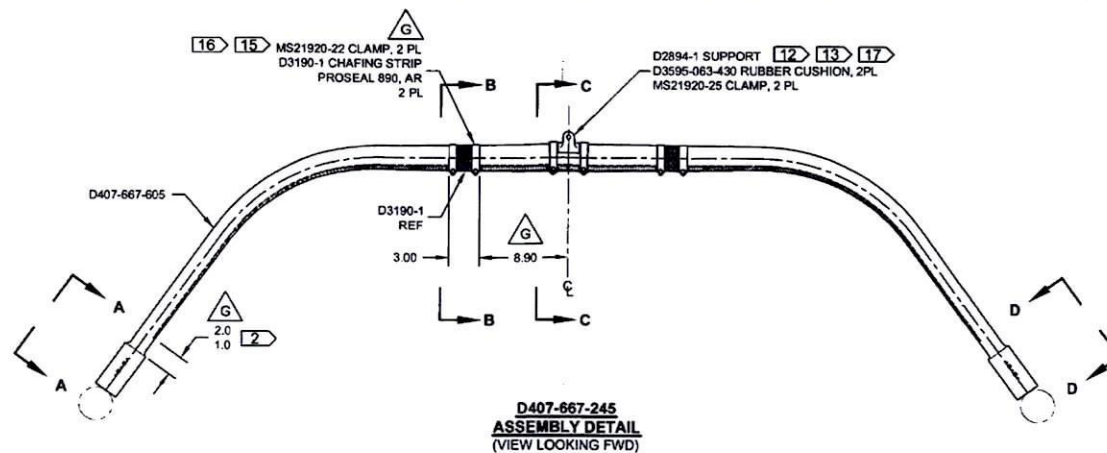
- MATERIAL: MANUFACTURED FROM D6011-115
FINISHED LENGTH = 112.91±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT CROSSTUBE PER DART QSI 005 4.2
FOR HATCHED AREAS (ZN A6-2), MASK AS REQUIRED
TO APPLY PRIME AND APPLY CLEAR COAT ONLY
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-667-245" AND BATCH NUMBER ON
INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 27.7 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN-OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 6 PASSES. MAXIMUM TUBE FLATTENING DUE TO
BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2894-1 CENTER SUPPORT USING A 0.04" TO 0.07" THICK LAYER OF SCOTCH-WELD
DP460 PER QSI 015. LET CURE FOR 24 HOURS AFTER INSTALLATION AND PRIOR TO
PACKAGING.
- INSTALL MS21920-25 CLAMPS WITH D3595-063-430 RUBBER CUSHIONS TO SECURE D2894-1
SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE CROSSTUBE
SUPPORT.
NOTE: MS21920-24 CLAMPS CAN BE USED TO ACCOMMODATE VARYING DIAMETERS.
ENSURE THERE IS A MINIMUM OF 1.5 THREADS IN SAFETY ON THE NUTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE
OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS
SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT
LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- APPLY A THIN COAT OF PROSEAL 890 ON INSIDE CONCAVE SURFACE OF D3190-1
CHAFING SHIELDS AND LET CURE PER MANUFACTURER'S INSTRUCTIONS. INSTALL
PROSEAL D3190-1 CHAFING SHIELDS ONTO CROSSTUBE BY APPLYING A THIN COAT
OF PROSEAL 890 ONTO CROSSTUBE. BE SURE TO ELIMINATE ANY AIR GAPS.
- INSTALL D3190-1 CHAFING SHIELDS SO THAT OVERLAP IS 50 TO 70 DEGREES FROM BOTTOM
OF CROSSTUBE OPPOSITE D2894-1 SUPPORT.
- TORQUE CLAMPS 80 TO 100 IN-LB. TORQUE CLAMPS ON D3190-1 CHAFING SHIELD 40 TO 50
IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT
BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS
AFTER ADHESIVE HAS CURED FOR 24 HOURS.

G	INCORP. DEO's D407-667-245-F1-F2 (ZN D6-1, A8-1, D5-2, B6-2, C6-2); 8.90 WAS 8.53 (ZN D5-2); TORQUE REDUCED FOR CHAFING SHIELD (ZN A8-1); FINISH REVISED TO ALLOW MANUFAC. FLEXIBILITY (ZN C6-1)	RF	15.03.20
F	REFORMAT NOTES TO NEW STANDARDS (ZN B6-1); RELOCATED FLAG # 6 (ZN A8-3) PER NCR 210; REMOVED REF. & ADD TOLERANCES (ZN C6-3, C4-3 & D2-3)	RF	08.11.06
E	8.02 AND 8.53 WERE 8.40 AND 8.90 (ZN D5-2); REORGANIZED VIEWS AND REFORMATED DRAWING TO CURRENT STANDARDS. REASONS: CLAMPS MOVED 0.375 TOWARD CL TO ELIMINATE INTERFERENCE WITH AIRCRAFT MOUNTS. REFERENCE: PAR#08-21 AND ECN#1225	MB	08.07.24
D	ADD VIEW FOR OEM SKID HOLES, ROTATE ORIENTATION OF CLAMPS SECTION F-F, REMOVE -861 ABRASION STRIP, ADD MAGNOBOND 6398, ADD CUSHION	PH	07.02.07
C	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHT/AA SKIDTUBES	PH	06.07.26
B	ADD CHAFING SHIELD	CP	03.05.21
A	NEW ISSUE	CP	02.05.13
REV.	DESCRIPTION	BY	DATE
DESIGN	4	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	4	DRAWING NO.	REV. G
MFG. APPR.	4	D407-667-245	SHEET 1 OF 4
APPROVED	4	TITLE	SCALE
DE APPR.	4	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
DATE	15.03.20	COPYRIGHT © 2003 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIES OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD	

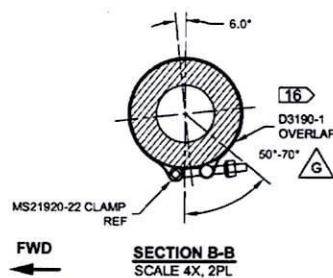
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2015 APR 09

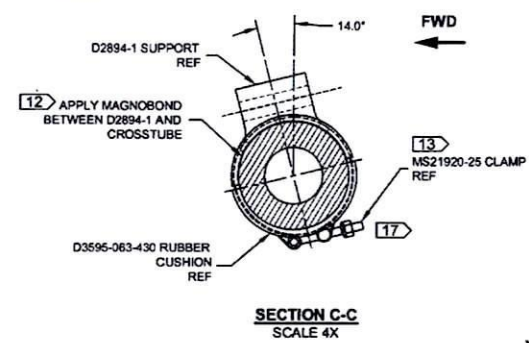
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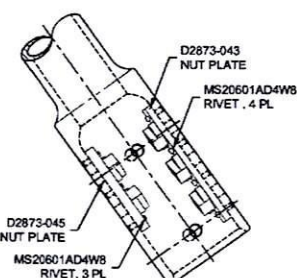
VIEW A-A CUFF DETAIL
SCALE 4X



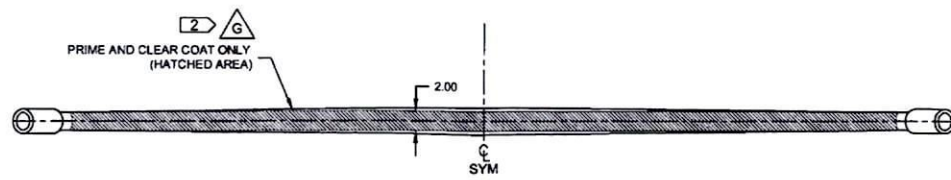
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SCALE 4X, 2PL



SECTION C-C
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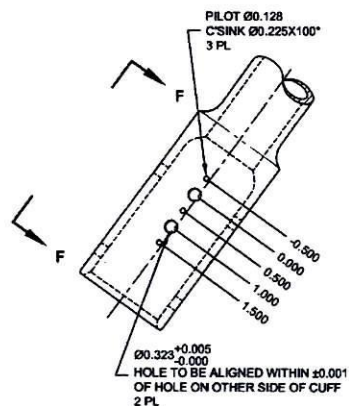
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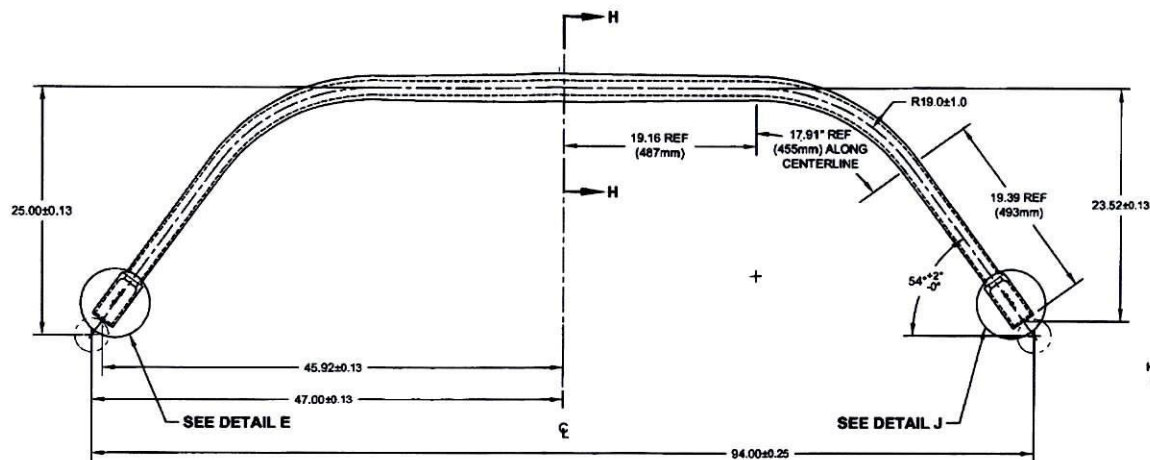
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MFG. APPR.	qf	D407-667-245	SHEET 2 OF 4
APPROVED	qf	TITLE	SCALE
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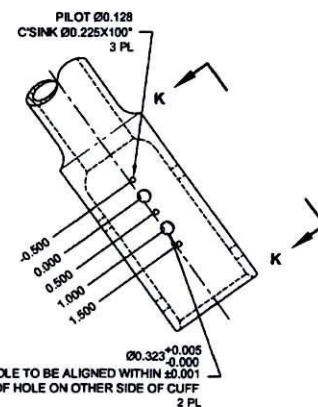
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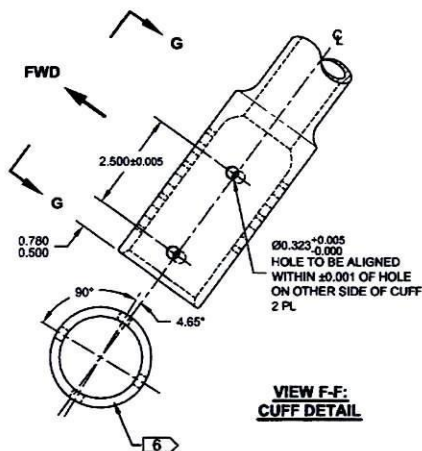
DETAIL E
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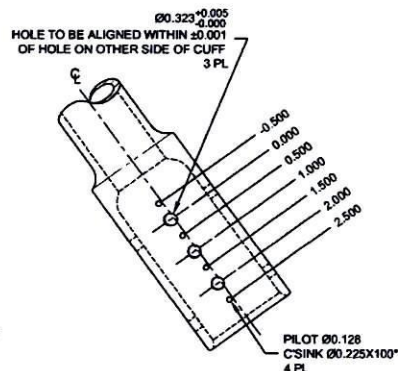
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BENDING AND DRILLING DETAIL
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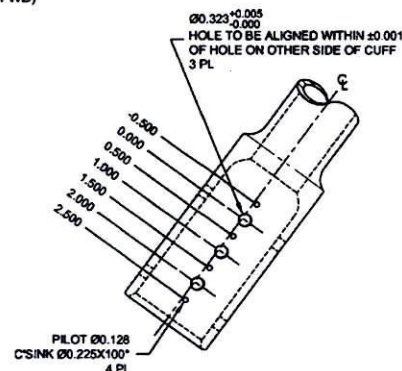
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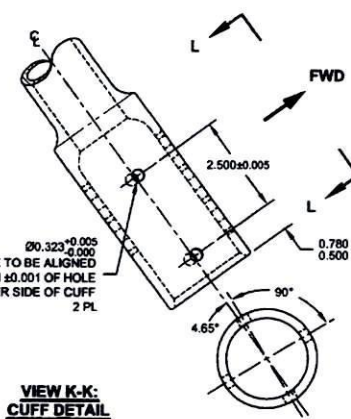
VIEW F-F:
CUFF DETAIL



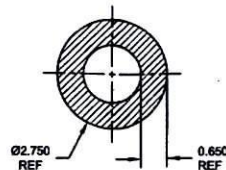
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(VIEW LOOKING AFT, ROTATED)



VIEW L-L
(VIEW LOOKING AFT, ROTATED)



VIEW K-K:
CUFF DETAIL



SECTION H-H
SCALE 4X

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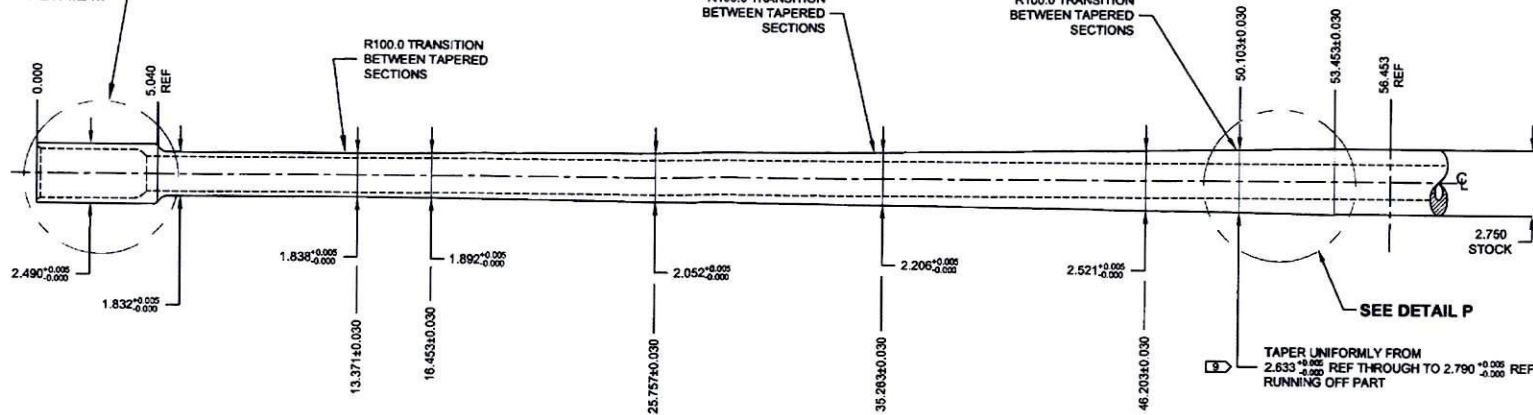
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MFG. APPR.	4P
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DE APPR.	4P
DATE	15.03.20

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HAWKESBURY, ONTARIO, CANADA

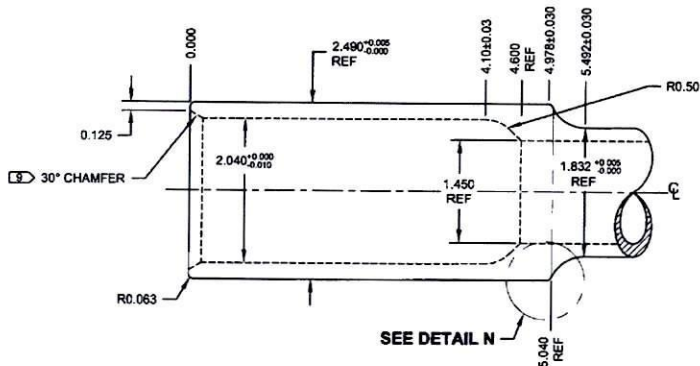
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D407-667-245	SHEET 3 OF 4
TITLE	SCALE
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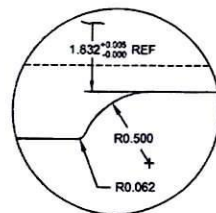
SEE DETAIL M



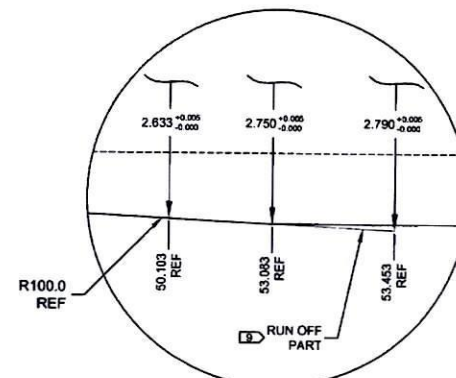
D407-667-245 MACHINING DETAIL



DETAIL M: CROSSTUBE CUFF
SCALE 3X



DETAIL N: CUFF TRANSITION
SCALE 2X

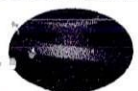


DETAIL P: TAPER RUN-OFF
NOT TO SCALE

RELEASED
2015 APR 09

DESIGN	RF	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	RF	DRAWING NO.	REV. G
MFG. APPR.	RF	D407-667-245	SHEET 4 OF 4
APPROVED	RF	TITLE	SCALE
DE APPR.	RF	CROSSTUBE ASS'Y (407 HIGH AFT)	NTS
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**skyservice****Work Order Traveler**

Sky Service F.B.O. Inc.

10105 Ryan Avenue, Dorval, Quebec, H9P 1A2

TCCA AMO 53-89 / EASA 145.7142 / BDA AMO 385

WO #: MWO34256	Customer: Dart Aerospace Ltd.	Dept: NDT YUL	Reference: PO038543
Descr:	PN:	S/N:	Qty: 1
Make:	Model:	Reg:	A/C S/N:
TSN:	CSN:	TSO:	
Task: UNSCHEDULED			Sequence: 1

Work Required:

CARRY OUT NDT ON 8 CROSSTUBES AS PER PO038543

1 AFT CROSSTUB , P/N# D407-667-205RLC , J/S# 167710

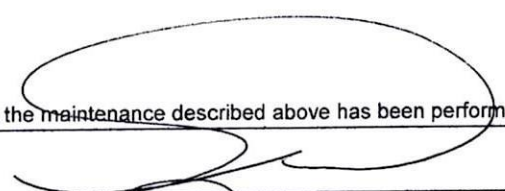
3 AFT CROSSTUBES , P/N# D407-667-205 , J/S# 162554, 168984, 168932

4 FWD CROSSTUBES , P/N# D407-667-105 , J/S# 164067, 164202, 164199, 164200

Action Taken:						Date:	Initial/Stamp:
LPI C/O IAW ASTM E-1417M-13 ***NO CRACK FOUND*** PEN. ZL-56, MPO13600, CLEANER SKC-S MPO13923 , DEV. MPO11715 , UV LIGHT M-20142						DEC 04 2017	 
Description	Location	P/N	Qty	Batch	S/N Off	S/N On	

17-12-5 

I certified that the maintenance described above has been performed in accordance with the applicable standard of airworthiness.

Signature: 	ACA/SCA Stamp 	Date: DEC 04 2017
Name: RAFIK MELIKIAN		

PURCHASE ORDER

Items										
Line Item	Job	Part	Description	Status	Due Date	Order Quantity	Received Quantity	Balance	Unit Price (CAD)	Extended Price
6	168932	D407-667-205	Aft Crosstube - High 407 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 0380	Firmed	12/6/17	1 pcs	0 pcs	1 pcs	\$131.875/pcs	\$131.88
7	168984	D407-667-205	Aft Crosstube - High 407 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 0380	Firmed	12/6/17	1 pcs	0 pcs	1 pcs	\$131.875/pcs	\$131.88
8	162554	D407-667-205	Aft Crosstube - High 407 *** WEAR LATEX GLOVES WHEN HANDLING CROSSTUBE*** Liquid Penetrant Inspection as per QSI 0380	Firmed	12/6/17	1 pcs	0 pcs	1 pcs	\$131.875/pcs	\$131.88
									Grand Total: \$1,061.00	

Order Notes

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Part Number: D407-667-205

Description: CROSSTUBE INSTALLATION, 407 HIGH AFT

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